

Analysis of ozone and chlorine disinfection byproducts concerning ballast water treatment

Jake Perrins, Bryan Nielsen, Russell Herwig*

University of Washington, School of Aquatic & Fishery Sciences

Keywords: Ballast Water, Disinfection by-products, Ozone, Chlorine

Numerous technologies are being considered for the treatment of ballast water for the prevention of non-indigenous species (NIS). Special concern must be taken to ensure that treated ballast water, when discharged, will not adversely impact the aquatic environment. One class of treatments is biocides, such as ozone and chlorine. The goal of ballast treatment is the removal, or inactivation, of organisms from several trophic levels. Some organisms may be more resistant to biocide treatment than others, requiring greater concentrations of biocide, and, for some biocides, may lead to the formation of disinfection byproducts. Prior to commercial application of any ballast treatment, final byproducts must be identified, including the concentrations at which they are found. The focus of our study was directed towards chlorine and ozone treatment of seawater. These chemicals are commonly used as disinfectants for drinking water. As of now, there are no disinfection byproducts regulated, or suggested for regulations in ballast water management standards. Regulated EPA drinking water analytes and their maximum concentration levels were considered as guidelines for byproducts in ballast water treatment. The regulated drinking water analytes, and compounds examined in our research, consist of halogenated organics such as trihalomethanes (THMs), haloacetic acids (HAAs), and bromate.